PROGRESS REPORTS

FROM

EXPERIMENT STATIONS

SEASON 1952-53

KENYA

PUBLISHED BY

THE EMPIRE COTTON GROWING CORPORATION,

12 CHANTREY HOUSE, ECCLESTON STREET,

LONDON, S.W.1.

1953

COMMONWEALTH MYCOLOGICAL INSTITUTE

4 DEC 1953

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KENYA
NYANZA PROVINCE

PROGRESS REPORT FOR THE SEASON 1952-53

BY

M. S. HASTIE.

Introduction.

The building and land clearing programmes of the three cotton stations are almost finished. Water supplies, when installed, will complete capital expenditure for these cotton investigational centres as planned by the Kenya Agricultural Department in 1951.

Table 1.

Rainfall in inches at three Nyanza Stations for the Cotton Season 1952-53.

	North Nyanza Bungoma	*Central Nyanza Kibos*	*South Nyanza Homa Bay*	
	Cotton Substation.	*Main Station.*	*Ginnery.*	*Cotton Substation.*
1952				
April	8·71	12·85	9·40	9·61
May	9·63	5·58	9·30	9·53
June	7·02	1·69	1·85	3·27
July	6·60	2·65	6·15	2·27
August	3·27	2·94	3·85	2·08
September	8·31	3·95	3·20	3·44
October	9·81	1·78	4·80	4·53
November	3·84	1·61	0·96	2·64
December	Nil	0·51	Nil	0·27
1953				
January	0·30	1·22	0·61	1·90
February	Nil	0·64	Nil	Nil
March	1·58	3·65	5·19	5·19
	59·07	39·07	45·31	44·73

In Nyanza Province it is the general custom to plant food crops at the beginning of the main rains, March/April, and then after the first weeding to open land for cotton. Rainfall during April and May was very heavy; at Homa Bay and Kibos about 50% and at Bungoma 30% of the season's total fell in the two months. The rains suddenly stopped at the beginning of June, and in consequence, land preparation was delayed. There followed a long dry spell during which a considerable acreage was prepared for cotton, but suitable planting rains did not occur till late July in North and Central Nyanza and a little earlier in South Nyanza. Most of the cotton in the province was planted between July and September, and the rainfall during the growing season was: Bungoma 31·83 inches. Kibos 13·44 inches, Homa Bay ginnery 18·96 inches, and Homa Bay Cotton Station 15·23 inches.

Cotton Crop.

A comparison of the 1952-53 crop with that of the previous season is given in Table 2.

Table 2.

Cotton Production in Nyanza by Ginneries, 1951-52 and 1952-53.

Ginnery.	*1951-52.* *Total (bales)*	*% BR.*	*1952-53.* *Total (bales)*	*% BR.*
South Nyanza				
Homa Bay	1,352	32·8	1,390	13·2
Central Nyanza				
Kibos	555	33·3	259	15·4
Ndere	2,074	18·0	853	7·9
Ukwamba	4,500	6·7	2,448	3·3
North Nyanza				
Nambare	2,292	5·5	1,759	2·4
Malakisi	1,285	8·0	1,242	2·8
Total	12,058	12·7	7,951	5·6

The figures shown for the 1952-53 crop are approximations estimated from buying returns. The letters BR represent "B" or lower grade cotton which has been roller ginned.

Buying in South Nyanza started early in December, and elsewhere on 5th January to conform with Uganda along the border. The quality of the seed cotton has been very good and shows an improvement on the previous season's crop, as can be seen from the reduced percentage of BR grade in Table 2. The yield has fallen considerably but this is mainly the result of the poor season. Homa Bay ginnery shows an increase in production over last season for which increased acreage is responsible.

Pests and Diseases.

Bollworm.

As found in the previous season, bollworm was the first active major pest on the cotton crop. The months of greatest activity were August and September, when the May/June plantings were beginning to set a crop. In South Nyanza, buds, flowers and bolls were shed in large numbers so that practically the whole of the early crop was lost. American bollworm (*Heliothis armigera*) was the most important species. Numerous spiny bollworms (*Earias spp.*) were found, but this year there were no signs of false codling moth (*Argyroploce leucotreta*).

Lygus.

Lygus made its first appearance this season in North and Central Nyanza early in September; activity increased till November and then diminished. The effect of *Lygus* was such that experiments on the

Bungoma sub-station for North Nyanza were completely ruined. The main cotton area, Samia, in Central Nyanza did not suffer heavy losses from *Lygus* attack although the pest was still active in February, which was later than anywhere else. In the adjoining Asembo Bay and Kano Plain areas losses were high.

In South Nyanza *Lygus* activity started early in July. The period of greatest activity and damage was mid September to early October. The effect of *Lygus* following the bollworm attack in this area was very considerable. The latter took the early crop and the former suppressed plant development by attacking growing plants, causing truncation of branches and shredding of developing leaves.

Bacterial Blight.

Bacterial blight (*Xanthomonas malvacearum*) was ubiquitous in the cotton areas by mid September, but only in North Nyanza did it cause serious damage. There, bacterial blight infection became severe at the end of September and appeared to cause more plant injury than *Lygus* up to that time. Many plants were deformed and killed, in addition to those which sustained considerable leaf damage. The worst affected part of North Nyanza was in the vicinity of Nambare, which is in a localised rain and hail belt.

In Central Nyanza some infection was found on early planted shambas in July and showed up worst where there was overcrowding of seedlings. At no time was this disease crippling but both angular leaf spot and blackarm phases were found.

Very slight losses were caused in South Nyanza. Most damage occurred along leaf veins but a few plants showing the blackarm phase were found. The earliest attack seen developed during July on early planted shambas and this disease remained active till December. At no time did it assume serious proportions.

On the whole, losses from bacterial blight were small, but had heavy rains fallen during the last quarter of 1952 the reduction in yield and lint quality might have been quite serious.

Stainers.

Fewer stainers were noted this season than during 1951-52. The areas where the greatest numbers were found were Asembo Bay, Kano Plain, and South Nyanza. The result of stainer activity is reflected in the higher BR figures shown at Kibos and Homa Bay as compared with the other ginneries, where the lowering of quality was due mainly to bacterial blight. The commonest species of stainers were *Dysdercus nigrofasciatus* and *D. superstitiosus.*

Other Pests.

Distribution of *Helopeltis* was sporadic; on the whole it was found on earlier planted and better grown shambas. It occurred on all three cotton stations, though the damage caused was negligible.

The only remaining area in the province where jassid is of any importance is South Nyanza. The susceptible N17 now grown there is being replaced by Uk48. This season, jassid burn was found in South Nyanza in September and the pest remained active till the end of December. The shortened growing season probably reduced liability to damage. On a plot of N17 on the Cotton Experiment Station, Kibos, jassid activity was noted in October. The nearest N17 area is 20 miles across the Kavirondo Gulf.

Results of Experiments.

Variety and Strain Trials.

Four variety and strain trials were planted, and the results are shown in Table 3.

Table 3.

Yields of seed cotton in lb. per acre from four Strain Trials. Nyanza 1952-53.

Variety or Strain	*North Nyanza*	*Central Nyanza*		*South Nyanza*
	Adungosis	*Kibos*	*Sio Port*	*Homa Bay*
Uk48	1,292	807	992	613
7/7	1,190	712	1,125	543
7/251	1,093	565	1,428	629
7/254	1,000	981	1,113	618
7/287	861	1,183	1,283	581
7/314	898	565	1,246	538
7/367	801	807	1,234	629
8/290	977	739	1,246	624
8/291	857	874	1,174	624
S47	935	—	1,319	—
DE715	792	—	1,309	—
Significance (P=0·05)	68	52	34	19
Design	Randomised Blocks	Randomised Blocks	Randomised Blocks	Randomised Blocks
No. of Replicns.	4	4	4	5
Plot Size	15′ × 30′	15′ × 54′	15′ × 30′	27′ × 30′
Planting Date	Early July	Early June	Late July	Early June
Spacing Cultivation	3′ × 2′ Flat	3′ × 2′ Ridged	3′ × 2′ Flat	3′ × 2′ Tie Ridged

In these trials Uk48 is the standard against which the other varieties and strains are to be compared. The early June planted experiments at Homa Bay and Kibos showed that at the former Uk48 was

not significantly outyielded by any strain, while at the latter three Ukiriguru strains were significantly better than Uk48 at P = 0·05. At Adungosis Uk48 significantly outyielded all other material under test but the reverse was the case at Sio Port. It would appear from these trials that where there is fairly early planting Uk48 compares favourably with the other varieties and strains, but later planting, as at Sio Port, does not give Uk48 long enough to lay down a crop. Observations made at Sio Port support this: picking of S47 and DE715 was finished some time before that of Uk48 and the Ukiriguru strains.

Seed Dusting Trials.

Five chemical dusts were tested to find to what degree they would control bacterial blight. Table 4 gives the yield figures of the experiments and the final plant stands per acre. The fraction shown after the site of each trial indicates whether the cotton seed (Uk48 was used throughout) was dusted at 1 part of dust to 150 or 300 parts by weight of seed.

TABLE 4.

Final stand per acre and seed cotton yield in lb. per acre in three Seed Dressing Trials.

DUST	*Kibos 1/300*		*Kibos 1/150*		*Homa Bay 1/150*	
	Final Stand	*Yield*	*Final Stand*	*Yield*	*Final Stand*	*Yield*
R.1078×78	3984	822	6763	737	12801	646
R.1214×23	4268	624	2567	718	11234	626
R.1214×78	3346	666	3403	624	11344	536
R.1489×32	4864	766	5062	718	11935	660
R.3067×23	4410	666	2893	548	11041	660
Untreated	2907	411	2340	529	11275	605
Sig. Diff. (P = 0·05)		72		44		26
Design		Randomised Blocks		Randomised Blocks		Randomised Blocks
No. of Replicns.		4		4		4
Plot Size		24′ × 32′		24′ × 32′		33′ × 24′
Planting Date		Late June		Late June		Early July
Spacing		3′ × 2′		3′ × 2′		3′ × 2′
Cultivation		Ridged		Ridged		Tie-Ridged

The Kibos experiments suffered badly from drought just after planting and in consequence plot stands were poor. Nevertheless, the yields of the dusted plots were significantly higher, with one exception, than those of the untreated plots. At Homa Bay, stands were very good and the effect of bacterial blight was slight. Analyses of stand and yield show that only 3 plots significantly outyielded the untreated control, and 3 plots had better stand counts.

Dusts R.1078 × 78 and R.1489 × 32 were consistent in producing the best yields in all the trials.

Plant Spacing Experiment.

The results of an experiment at Homa Bay to test three different spacings are shown in Table 5.

TABLE 5.

Spacing Trial: Homa Bay 1952-53.

YIELDS OF SEED COTTON IN LB. PER ACRE.

Spacing	*Yield*
3′ × 2′	797
3′ × 3′	766
3′ × 4′	676
Sig. Diff. at P = 0·05	31

Four randomised blocks of plots 21′ × 24′
Land tie-ridged and planted in early June.

The variety used was Uk48, which is to be grown throughout South Nyanza in the near future. The standard spacing at Homa Bay sub-station is 3′ × 2′ and this trial was laid down to see whether Uk48 would benefit from wider spacing. At 3′ × 3′ the reduction in yield is just significant and very significant at 3′ × 4′.

Cultivation Trial.

The results of an experiment at Kibos to test 4 different methods of cultivation are shown in Table 6.

TABLE 6.

Cultivation Trials: Kibos 1952-53.

YIELDS OF SEED COTTON IN LB. PER ACRE.

Treatment	*Yield*
Flat	664
Ridges 3′ apart	681
,, 3′ ,, with ties	743
,, with 3′ tops and ties	799
Sig. Diff. (P = 0·05)	78

4′ × 4′ Latin square with 54′ × 36′ plots.
Spacing 3′ × 2′, planted early June.

Both cultivations with ties were significantly better than the normal flat cultivation. This was to be expected, as they are measures of water conservation and the season was very dry.

Conclusion.

Each district in the Nyanza Province cotton area differs in soil and climate. Within North and Central Nyanza are found microclimates which produce their own special conditions. These variations of soil, altitude, and rainfall of the different areas necessitate different dates of planting and types of cultivation. Also involved in establishing optimum dates of planting are the insect pests, bollworm and *Lygus*. It has yet to be proved that early planting would result in better yields, but it has been suggested that April/May planted cotton would benefit from the rains during these months and produce large plants which could withstand insect attack. Experiments which will answer the above questions are in progress at present. Should the evidence indicate that early planting and some type of cultivation other than flat produce the best results, a further set of factors would have to be faced. The present native practice is to plant cotton on the flat after the food crops have been planted. Early planting would conflict with the planting of maize and sorghum, and ridging or some other variation of it would involve extra effort on the part of the grower. This would not be popular. The solution of this would appear to lie in agricultural education.

Improved agricultural practices will produce the quickest increase of the cotton crop, while cotton breeding and entomological work, which are long-term solutions, can only be shown to advantage once the basic agricultural problems are solved.

Received June 1953.

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